

# Claims

- [c1] 1. An automatic gain control circuit, for controlling a start-up time of an oscillator, wherein the start-up time of the oscillator varies with a magnitude of an output current of a current generator, the automatic gain control circuit comprising:
- an oscillation detection unit, for outputting a detection signal when the oscillator oscillates is detected; and
- a control unit coupled to the oscillation detection unit, for determining whether the detection signal is received at a first predetermined time point, and
- wherein when the detection signal is not received at the first predetermined time point, the control unit outputs a control signal to increase the output current of the current generator.
- [c2] 2. The automatic gain control circuit of claim 1 wherein the control unit further comprises:
- a first flag generator coupled to the oscillation detection unit for determining whether the detection signal is received at the first predetermined time point, wherein
- when the detection signal is not received at the first predetermined time point, the first flag generator outputs a

first flag signal; and  
an output current control circuit coupled to the first flag generator wherein when the first flag signal is received, the output current control circuit outputs the control signal to increase the output current of the current generator.

[c3] 3. The automatic gain control circuit of claim 2 wherein the first flag generator comprises a D-type flip flop.

[c4] 4. The automatic gain control circuit of claim 2 wherein the output current control circuit comprises a counter.

[c5] 5. The automatic gain control circuit of claim 4 wherein the output current control circuit further comprises an AND gate for receiving outputs of the counter; and a NOR gate for providing a clock signal to the counter and receiving the first flag signal and an output of the AND gate.

[c6] 6. The automatic gain control circuit of claim 4 wherein the control unit further comprises:  
a second flag generator coupled to the oscillator detection unit for determining whether the detection signal is received at a second predetermined time point, wherein when the detection signal is not received at the second predetermined time point, the second flag generator

outputs a second flag signal; and  
a timing circuit coupled to the second flag generator, for outputting a reset signal to reset a counting value of the counter when the second flag signal is not received for a predetermined time interval.

[c7] 7. The automatic gain control circuit of claim 6 wherein the second flag generator comprises a D-type flip-flop.

[c8] 8. The automatic gain control circuit of claim 6 wherein timing circuit comprises a counter.

[c9] 9. The automatic gain control circuit of claim 1 wherein the oscillation detection unit further comprises:  
a comparator for detecting an oscillation output of the oscillator; and  
a latch coupled to the comparator, for latching the detection signal, wherein when the comparator detects the oscillation output of the oscillator, the latch outputs the latched detection signal and feedbacks the latched detection to the comparator to disable the comparator.

[c10] 10. The automatic gain control circuit of claim 9 wherein the comparator is a delay comparator.

[c11] 11. An automatic gain control method for controlling a start-up time of an oscillator, wherein the start-up time of the oscillator varies with a magnitude of an output

current of a current generator, the method comprising steps of:

detecting an oscillation output of the oscillator, and then outputting a detection signal when the oscillator oscillates is detected; and

determining whether the detection signal is received at a first predetermined time point wherein when the detection signal is not received at the first predetermined time point, the control unit outputs a control signal to increase the output current of the current generator.

[c12] 12. The method of claim 11, further comprising steps of: determining whether the detection signal is received at a second predetermined time point; and decreasing the output current of the current generator when the detection signal is received at the second predetermined time point and lasts for a predetermined time interval.

[c13] 13. The method of claim 11 wherein a method to increase the output current of the current generator is to adjust a gain of the current generator.

[c14] 14. The method of claim 11 wherein a method to increase the output current of the current generator is to adjust an offset of the output current generated by the current generator.

